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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/511,454  
Filing Date: October 12, 2004  
Appellant(s): ZHOU, XIAO-QI  
KNOLL, PAULA M.

**MAILED**  
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Sandra P. Thompson  
For Appellant

### **EXAMINER'S ANSWER**

This is in response to the appeal brief filed on July 23, 2007 appealing from the Office action mailed on April 17, 2007.

#### **(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

#### **(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

#### **(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

#### **(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes due to some typographical errors in appellant's brief under the instant subtitle (last item) is as follows:

Claims 16 and 50 are rejected under 35 USC§ 103(a) as unpatentable over Hanson (US 5 950066) in view of Matayabas'731 (US 2003/0168731).

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

US 6 469 379	Matayabas	10-2002
US 6 040 362	Mine	03-2000
US 4 292 225	Theodore	09-1981
US 5 950 066	Hanson	09-1999

US 2003/0168731

Matayabas'731

09-2003

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

A) Claims 1-10, 12-20, 25-44, 46-55 and 59-64 are rejected under 35

U.S.C. 102(e) as being anticipated by Matayabas (US 6 469 379).

Matayabas discloses a thermal interface composition comprising a vinyl-containing polydiorganosiloxane, two Si-H containing polydiorganosiloxanes. Additives such as catalyst, inhibitors, etc. can be used. Fillers such as copper, boron nitride, etc. can be used. (col. 3, line 19 to col. 4, line 38 and col. 5, line 66 to col. 6, line 39) The particle sizes of the fillers are described in col. 6, lines 13-22, which can be considered as micro-fillers. Since the vinyl-containing polydiorganosiloxane and the Si-H containing polydiorganosiloxane have different substituents, Examiner has a reasonable basis to believe that each has a different solubility parameter. The composition can be used for preparing integrated circuit package, etc. (col. 6, line 51 to col. 8, lines 21)

B) Claims 1-14, 16, 18-20, 22-23, 25-48, 50, 52-57 and 59-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Mine (US 6 040 362).

Mine discloses a thermal interface composition comprising components A) to C). Component C) can be a platinum catalyst. (col. 2, line 5 to col. 5, line 9) Since components A) (containing Si-alkenyl groups) and B) (containing Si-H groups) have different substituents, Examiner has a reasonable basis to believe that each has a different solubility parameter. An inhibitor can be use. (col. 6, lines 23-41) Fillers such as silica, copper, etc. can be used. (col. 6, line 42 to col. 7, line 33) The composition can be used for preparing IC, etc. (col. 8, lines 21-41)

C) Claims 1-15, 17-26, 35-49 and 51-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Theodore (US 4 292 225).

Theodore discloses a composition comprising a vinyl or allyl group-containing polydiorganosiloxane, a Si-H containing polydiorganosiloxane, silica and boron nitride. A platinum catalyst can be used. An inhibitor such as silicone oligomer containing alkenyl groups, quinoline, etc. can be used. (col. 2, line 62 to col. 5, line 15 and Examples) Since the vinyl or allyl group-containing polydiorganosiloxane and the SiH-containing polydiorganosiloxane have different substituents, Examiner has a reasonable basis to believe that each has a different

solubility parameter. A viscosity modifier (rheological modifier) can be used, which can be non-reactive (i.e., solvent). (col. 2, lines 36-58) The preambles “thermal interface composition” and “coating composition” are merely intended use, and do not carry any weight of patentability.

D) Claims 1-5, 8-10, 12-15, 17-18, 25-39, 43-44, 46-49, 51-52 and 59-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanson (US 5 950 066).

Hanson discloses a thermal interface composition comprising a blend of polyorganosiloxane graft polymer of octadecene, a methylsiloxane host and fillers such as alumina, boron nitride, metal powders, etc. and mixtures thereof. (col. 3, line 58 to col. 4, line 48) The particle sizes of the fillers are described in col. 4, lines 9-22. Since the polyorganosiloxane graft polymer of octadecene and methylsiloxane host have different substituents, Examiner has a reasonable basis to believe that each has a different solubility parameter.

E) Claims 21, 24, 55 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matayabas (US 6 469 379).

Matayabas discloses a thermal interface composition, *supra*, which is incorporated herein by reference. Matayabas is silent on the use of a rheological

modifier such as a solvent. However, a solvent can affect the properties of the composition such as processibility, shear modulus, etc. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention was made to incorporate a solvent in the composition in order to afford a thermal interface composition with desired properties.

F) Claims 22 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matayabas (US 6 469 379) in view of Mine (US 6 040 362).

Matayabas discloses a thermal interface composition, *supra*, which is incorporated herein by reference. Matayabas is silent on the specific catalyst set forth in the instant claims. However, Mine teaches the use of a platinum catalyst for curing a polysiloxane-based thermal interface composition. (col. 4, line 59 to col. 5, line 9) The motivation is to facilitate the curing the composition. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize Mine's platinum catalyst for curing Matayabas' composition.

G) Claims 21 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson (US 5 950 066).



Hanson discloses a thermal interface composition, *supra*, which is incorporated herein by reference. Hanson is silent on the use of a rheological modifier. However, Hanson teaches the viscosity is important. (col. 4, lines 9-22) Furthermore, a rheological modifier can affect the viscosity of the composition. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention was made to incorporate a rheological modifier in the composition in order to afford a thermal interface composition with desired viscosity.

H) Claims 16 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Matayahas'731 (US 2003/0168731).

Hanson discloses a thermal interface composition comprising metal powders, *supra*, which is incorporated herein by reference. Hanson is silent on the specific use of copper. However, Matayahas'731 teaches the use of copper in a thermal interface composition. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Matayahas'731's copper in Hanson's composition.

#### **(10) Response to Argument**

A) Claims 1-10, 12-20, 25-44, 46-55 and 59-64 are rejected under 35 U.S.C. 102(e) as being anticipated by Matayabas (US 6 469 379).

**For Applicants' argument (page 6, whole page)**, first, it appears that in line 3, "Column 7" should read "Column 5". Second, Applicants primarily argue that Matayabas teaches the **preferable** use of low molecular weight silicone oils. (col. 5, lines 55-65) Furthermore, according to the background section of Applicants' specification (page 3, lines 8-24), a silicone typically has a considerable amount of volatile, low molecular weight components that are not desirable because these components will unavoidably escape out of the bulk base. In other words, Applicants imply that Matayabas' low molecular weight silicone oils will contain certain components that might migrate to the surface of the cured bulk base.

However, Applicants' argument is **not persuasive** because:

a) Although Matayabas preferably uses low molecular weight silicone oils, this is merely a **preferred embodiment**. Matayabas certainly teaches the use of high(er) molecular weight silicone oils.

b) Matayabas' low molecular weight silicone oils carry **reactive functional groups**. (col. 3, line 19 to col. 4, line 38 and Figures 1-3) After reaction, the

silicone oils are crosslinked (i.e., immobilized). Therefore, they will not “escape” out of the bulk base;

c) The implication of Matayabas’ silicone oils containing **unreactive volatiles** that might eventually escape out of the bulk base is merely a speculation/an opinion because there is **no evidence** whatsoever in Matayabas’ disclosure teaches or suggests the presence of unreactive volatiles. Applicants are thus reminded that the arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); and

d) the subject matter at issue is **not** even claimed.

**For Applicants’ argument (page 7, whole page)**, the primary issues are:

- a) Matayabas’ two silicone oils do not have two different solubility parameters or/thus do not separate into two distinct phases; and
- b) Matayabas’ low molecular weight silicone oil are preferably used (implying the undesirable effects, *supra*)

Regarding a), it is well known that the basic concept of solubility parameter is “like dissolves like”, i.e., a substance will tend to dissolve a substance possessing a similar solubility parameter. Furthermore, the solubility parameter

strongly depends on the constituents of the substance. Notably, the **extent of difference** in solubility parameters is **not** specified and claimed. Since Metayabas' two silicone oils containing two **different** functional groups, the solubility parameters thereof are inherently "different". Furthermore, the argument regarding phase separation is lack of merit because it is **not even claimed**.

Regarding b), Applicants' argument is **not persuasive** because:

i) Although Matayabas preferably uses low molecular weight silicone oils, this is merely a **preferred embodiment**. Matayabas certainly teaches the use of high(er) molecular weight silicone oils.

ii) Metayabas' low molecular weight silicone oils carry **reactive functional groups**. (col. 3, line 19 to col. 4, line 38 and Figures 1-3) After reaction, the silicone oils are crosslinked (i.e., immobilized). Therefore, they will not "escape" out of the bulk base;

iii) The implication of Metayabas' silicone oils containing **unreactive volatiles** that might eventually escape out of the bulk base is merely a speculation/an opinion because there is **no evidence** whatsoever in Metayabas' disclosure teaches or suggests the presence of unreactive volatiles. Applicants are thus reminded that the arguments of counsel cannot take the place of evidence in

the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965);  
and

iv) The subject matter at issue is **not** even claimed.

B) Claims 1-14, 16, 18-20, 22-23, 25-48, 50, 52-57 and 59-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Mine (US 6 040 362).

**For Applicants' argument (page 10, whole page)**, the primary issue is that Mine's two siloxane-based compounds do not have two different solubility parameters or/thus do not separate into two distinct phases. However, it is well known that the basic concept of solubility parameter is "like dissolves like", i.e., a substance will tend to dissolve a substance possessing a similar solubility parameter. Furthermore, the solubility parameter strongly depends on the constituents of the substance. Notably, the **extent of difference** in solubility parameters is **not** specified and claimed. Since Mine' two siloxane-based compounds containing two **different** functional groups, the solubility parameters thereof are inherently "different". Furthermore, the argument regarding phase separation is lack of merit because it is **not even claimed**.

C) Claims 1-15, 17-26, 35-49 and 51-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Theodore (US 4 292 225).

**For Applicants' argument (page 12, whole page),** the primary issue is that Theodore's two siloxane-based compounds do not have two different solubility parameters or/thus do not separate into two distinct phases. However, it is well known that the basic concept of solubility parameter is "like dissolves like", i.e., a substance will tend to dissolve a substance possessing a similar solubility parameter. Furthermore, the solubility parameter strongly depends on the constituents of the substance. Notably, the **extent of difference** in solubility parameters is **not** specified and claimed. Since Theodore's two silicone oils containing two **different** functional groups, the solubility parameters thereof are inherently "different". Furthermore, the argument regarding phase separation is lack of merit because it is **not even claimed**.

D) Claims 1-5, 8-10, 12-15, 17-18, 25-39, 43-44, 46-49, 51-52 and 59-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanson (US 5 950 066).

**For Applicants' argument (page 14, whole page),** the primary issue is that Hanson's two siloxane-based compounds do not have two different solubility parameters or/thus do not separate into two distinct phases. However, it is well

known that the basic concept of solubility parameter is “like dissolves like”, i.e., a substance will tend to dissolve a substance possessing a similar solubility parameter. Furthermore, the solubility parameter strongly depends on the constituents of the substance. Notably, the **extent of difference** in solubility parameters is **not** specified and claimed. Since Hanson’s two silicone oils containing two **different** functional groups, the solubility parameters thereof are inherently “different”. Furthermore, the argument regarding phase separation is lack of merit because it is **not even claimed**.

E) Claims 21, 24, 55 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matayabas (US 6 469 379).

**For Applicants’ argument (page 15, 2<sup>nd</sup> paragraph)**, first, it is possible that an independent claim is rejected as being anticipated by a reference, and a dependent claim thereof is rejected as being obvious over the reference because of the presence of additional limitation(s) in the dependent claim. Second, Applicants did not specifically dispute the assertion of the obviousness of using a rheological modifier.

**For Applicants’ argument (page 15, last paragraph to page 16, 2<sup>nd</sup> paragraph)**, Examiner’s position is set forth in item A) above.

F) Claims 22 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matayabas (US 6 469 379) in view of Mine (US 6 040 362).

**For Applicants' argument (page 17, 2<sup>nd</sup> paragraph),** it is possible that an independent claim is rejected as being anticipated by a reference, and a dependent claim thereof is rejected as being obvious over the reference because of the presence of additional limitation(s) in the dependent claim.

**For Applicants' argument (page 17, last paragraph to page 18, 2<sup>nd</sup> paragraph),** Examiner's position is set forth in item A) above.

G) Claims 21 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson (US 5 950 066).

**For Applicants' argument (page 19, 2<sup>nd</sup> paragraph),** first, it is possible that an independent claim is rejected as being anticipated by a reference, and a dependent claim thereof is rejected as being obvious over the reference because of the presence of additional limitation(s) in the dependent claim. Second, Applicants did not specifically dispute the assertion of the obviousness of using a rheological modifier.



**For Applicants' argument (page 19, last paragraph to page 20, 2<sup>nd</sup> paragraph),** Hanson does not appear to teach the use of low molecular weight silicone-based compounds. Even if Hanson does, Examiner's position set forth in item A) is applicable here.

H) Claims 16 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Matayahas'731 (US 2003/0168731).

**For Applicants' argument (page 21, 2<sup>nd</sup> paragraph),** it is possible that an independent claim is rejected as being anticipated by a reference, and a dependent claim thereof is rejected as being obvious over the reference because of the presence of additional limitation(s) in the dependent claim.

**For Applicants' argument (page 21, last paragraph to page 22, 2<sup>nd</sup> paragraph),** Hanson does not appear to teach the use of low molecular weight silicone-based compounds. Even if Hanson does, Examiner's position set forth in item A) is applicable here.

**(11) Related Proceeding(s) Appendix**

None

For the above reasons, it is believed that the rejections should be sustained.

Art Unit: 1796

Respectfully submitted,



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October 25, 2007

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